

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 04 October 2000 (04.10.00)	
International application No. PCT/FI00/00054	Applicant's or agent's file reference 990198 WO
International filing date (day/month/year) 27 January 2000 (27.01.00)	Priority date (day/month/year) 03 February 1999 (03.02.99)
Applicant LEPPÄNEN, Yrjö et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

28 August 2000 (28.08.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer F. Baechler Telephone No.: (41-22) 338.83.38
--	--

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

OUTOKUMPU OYJ
Intellectual Property Management
P.O. Box 27
FIN-02201 Espoo
FINLANDE

Date of mailing (day/month/year) 04 October 2000 (04.10.00)	IMPORTANT NOTIFICATION International filing date (day/month/year) 27 January 2000 (27.01.00)
Applicant's or agent's file reference 990198 WO	
International application No. PCT/FI00/00054	

1. The following indications appeared on record concerning:	
<input type="checkbox"/> the applicant	<input type="checkbox"/> the inventor <input checked="" type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address OUTOKUMPU OYJ Patent Services P.O. Box 27 FIN-02201 Espoo Finland	State of Nationality
	State of Residence
	Telephone No. 358-9-4211
	Facsimile No. 358-9-4212978
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:	
<input type="checkbox"/> the person	<input type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address OUTOKUMPU OYJ Intellectual Property Management P.O. Box 27 FIN-02201 Espoo Finland	State of Nationality
	State of Residence
	Telephone No. 358-9-4211
	Facsimile No. 358-9-4212978
3. Further observations, if necessary:	
4. A copy of this notification has been sent to:	
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer F. Baechler Telephone No.: (41-22) 338.83.38
---	---

PATENT COOPERATION TREATY

PCT/IB/308/00054

PCT

From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

OUTOKUMPU OYJ
Patent Services
P.O. Box 27
FIN-02201 Espoo
FINLANDE

Received

Aika

21.08.00

Date of mailing (day/month/year) 10 August 2000 (10.08.00)		IMPORTANT NOTICE	
Applicant's or agent's file reference 990198 WO			
International application No. PCT/FI00/00054	International filing date (day/month/year) 27 January 2000 (27.01.00)	Priority date (day/month/year) 03 February 1999 (03.02.99)	
Applicant OUTOKUMPU OYJ et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU,JP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
BG,BR,CA,CN,DE,EA,EP,ES,ID,IN,KZ,MX,NO,PL,PT,RO,RU,SE,TR,YU,ZA

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 10 August 2000 (10.08.00) under No. WO 00/45978

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF
THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

Date of mailing (day/month/year) 10 August 2000 (10.08.00)	IMPORTANT NOTICE
Applicant's or agent's file reference 990198 WO	International application No. PCT/FI00/00054
<p>The applicant is hereby notified that, at the time of establishment of this Notice, the time limit under Rule 46.1 for making amendments under Article 19 has not yet expired and the International Bureau had received neither such amendments nor a declaration that the applicant does not wish to make amendments.</p>	

PATENT COOPERATION TREATY

IPM

1 2. 04. 2001

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Received

PCT

Chiva

To:

Outokumpu OYJ Intellectual
Property Management
P.O. Box 27
FIN-02201 Espoo
Finland

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing (day/month/year)	10-04-2001
-------------------------------------	------------

Applicant's or agent's file reference
990198W0

IMPORTANT NOTIFICATION

International application No. PCT/FI00/00054	International filing date (day/month/year) 27-01-2000	Priority date (day/month/year) 03-02-1999
---	--	--

Applicant
Outokumpu Oyj
et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/
Patent- och registreringsverket
Box 5055
S-102 42 STOCKHOLM
Facsimile No. 08-667 72 88

Telex
17978
PATOREG-S

Authorized officer

CHIVA ROYANBERG

Telephone No. 08-782 25 00

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 990198 WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI00/00054	International filing date (<i>day/month/year</i>) 27.01.2000	Priority date (<i>day/month/year</i>) 03.02.1999
International Patent Classification (IPC) or national classification and IPC ₇ B22C 9/24, B22D 27/04, B22D 19/00		
Applicant Outokumpu Oyj et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28.08.2000	Date of completion of this report 05.04.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Telex 17978 Box 5055 PATOREG-S S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Mårten Hulthén/MP Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

Intern application No.

PCT/FI00/00054

I. Basis of the report

1. With regard to the **elements** of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00054

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☒ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00054

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-4, 6	YES
	Claims	5	NO
Inventive step (IS)	Claims		YES
	Claims	1-6	NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Claims 1-4:

The invention relates to an upwards open casting mould constructed from separate highly thermo-conductive water-cooled copper plates. The inner part of the mould is lined with highly thermo-conductive material such as graphite-plates.

Document GB 1386645 (page 4, lines 20-27; claim 1) discloses a casting mould for making reactor cooling elements. The mould differs from the mould according to the invention in that it is made from cast iron instead of copper.

Document 4252178 (column 3, lines 17-32; figure 1) discloses a mould for casting of copper slabs consisting of a copper box (1) lined with graphite plates (3) and equipped with cooling pipes (9). It also deals with the problem of preventing sticking to the surface of the mould (column 1, lines 59-65) as mentioned in the description of the application (page 2, lines 25-26). The mould differs from the mould according to claim 1 of the application in that it is intended for continuous casting.

The casting mould defined by claim 1 is considered to be obvious to a person skilled in the art when viewing the two above-mentioned documents in combination.

Claims 2-4 define embodiments that are considered to be obvious in regard to the above-mentioned documents.

With respect to arguments presented above, claims 1-4 are not considered to involve an inventive step.

.../...

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

Claims 5-6:

The invention relates to a cooling element including cooling pipes fabricated in a mould. In order to eliminate the risk of the pipes melting during casting, the piping is made of nickel-copper because its melting point is higher than that of the copper cast around it.

Document GB 1424522 (page 1, lines 58-62; page 2, lines 28-36; figures 1-5; claims 1, 6-7, 11) discloses a cooling element including a cooling pipe manufactured of nickel-copper. It is fabricated in a similar manner as the invention. Claim 5, therefore, lacks novelty.

A cooling element including shaped pieces is disclosed by US 4892293 (abstract, detail 1). The cooling element defined by claim 6 is considered to be obvious when viewing the two last-mentioned documents in combination.

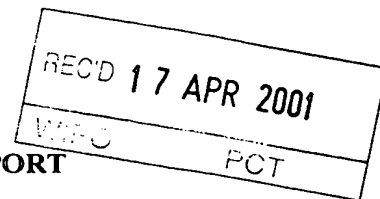
With respect to arguments presented above, claims 5-6 are not considered to involve an inventive step.



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



9

Applicant's or agent's file reference 990198 WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/FI00/00054	International filing date (day/month/year) 27.01.2000	Priority date (day/month/year) 03.02.1999
International Patent Classification (IPC) or national classification and IPC ₇ B22C 9/24, B22D 27/04, B22D 19/00		
Applicant Outokumpu Oyj et al		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of _____ sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input checked="" type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 28.08.2000	Date of completion of this report 05.04.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Mårten Hulthén/MP Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00054

1. Basis of the report

1. With regard to the **elements** of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00054

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☒ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00054

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-4, 6</u>	YES
	Claims	<u>5</u>	NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-6</u>	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Claims 1-4:

The invention relates to an upwards open casting mould constructed from separate highly thermo-conductive water-cooled copper plates. The inner part of the mould is lined with highly thermo-conductive material such as graphite-plates.

Document GB 1386645 (page 4, lines 20-27; claim 1) discloses a casting mould for making reactor cooling elements. The mould differs from the mould according to the invention in that it is made from cast iron instead of copper.

Document 4252178 (column 3, lines 17-32; figure 1) discloses a mould for casting of copper slabs consisting of a copper box (1) lined with graphite plates (3) and equipped with cooling pipes (9). It also deals with the problem of preventing sticking to the surface of the mould (column 1, lines 59-65) as mentioned in the description of the application (page 2, lines 25-26). The mould differs from the mould according to claim 1 of the application in that it is intended for continuous casting.

The casting mould defined by claim 1 is considered to be obvious to a person skilled in the art when viewing the two above-mentioned documents in combination.

Claims 2-4 define embodiments that are considered to be obvious in regard to the above-mentioned documents.

With respect to arguments presented above, claims 1-4 are not considered to involve an inventive step.

.../...

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

Claims 5-6:

The invention relates to a cooling element including cooling pipes fabricated in a mould. In order to eliminate the risk of the pipes melting during casting, the piping is made of nickel-copper because its melting point is higher than that of the copper cast around it.

Document GB 1424522 (page 1, lines 58-62; page 2, lines 28-36; figures 1-5; claims 1, 6-7, 11) discloses a cooling element including a cooling pipe manufactured of nickel-copper. It is fabricated in a similar manner as the invention. Claim 5, therefore, lacks novelty.

A cooling element including shaped pieces is disclosed by US 4892293 (abstract, detail 1). The cooling element defined by claim 6 is considered to be obvious when viewing the two last-mentioned documents in combination.

With respect to arguments presented above, claims 5-6 are not considered to involve an inventive step.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00054

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B22C 9/24, B22D 27/04, B22D 19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B22C, B22D, F27D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 1386645 B (OUTOKUMPU OY), 12 March 1975 (12.03.75), page 4, line 20 - line 27, claim 1 --	1-4
Y	US 4252178 A (ANTHONY W. HUDD), 24 February 1981 (24.02.81), column 3, line 17 - line 32, figure 1 --	1-4
A	GB 1547761 B (DAVY-LOEWY LIMITED), 27 June 1979 (27.06.79), claims 1,4 --	1-4
A	EP 0816515 A1 (MAN GUTEHOFFNUNGSHÜTTE AKTIENGESELLSCHAFT), 7 January 1998 (07.01.98), column 2, line 27 - line 36 --	1-6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 June 2000

Date of mailing of the international search report

06 -07- 2000

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Mårten Hulthén/MP

Telephone No. +46 8 782 25 00

2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00054

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 8700779 A1 (FONDERIES ET AFFINAGE DE L'ISERE), 12 February 1987 (12.02.87), abstract --	1-4
A	WO 9830345 A1 (PAUL WURTH S.A.), 16 July 1998 (16.07.98), abstract --	1-4
A	GB 2007549 A (HITACHI LTD), 23 May 1979 (23.05.79), figures 2-3 --	1-4
X	GB 1424532 B (JAMES BROWN & SONS LIMITED), 11 February 1976 (11.02.76), page 1, line 58 - line 62; page 2, line 28 - line 36, figures 1-5, claims 1,6,7	5
Y	 --	6
Y	US 4892293 A (YOICHIRO KATO ET AL), 9 January 1990 (09.01.90) --	6
A	GB 2261394 A (THYSSEN GUSS AG), 19 May 1993 (19.05.93), page 2, line 7 - line 16 --	5-6
A	US 4620507 A (HIROMICHI SAITO ET AL), 4 November 1986 (04.11.86), column 4, line 18 - line 22, figures 1-2 -- -----	5-6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI00/00054

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).:

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- I. Claims 1-4 relate to a casting mould made of copper plates.
- II. Claims 5-6 relate to a cooling element involving cooling pipes manufactured of nickel copper.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.

PCT/FI 00/00054

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
GB	1386645	B	12/03/75	FI	47052 B	31/05/73
US	4252178	A	24/02/81	AU	519742 B	17/12/81
				AU	3596978 A	15/11/79
				BE	867184 A	17/11/78
				BR	7803160 A	26/12/78
				DD	135863 A	06/06/79
				DE	2821999 A,C	07/12/78
				DE	2858250 C	18/12/86
				DK	217378 A	20/11/78
				ES	470029 A	16/01/79
				FI	62776 B,C	30/11/82
				FI	781595 A	20/11/78
				FR	2391012 A,B	15/12/78
				GB	1583592 A	28/01/81
				IE	47272 B	08/02/84
				IT	1094767 B	02/08/85
				IT	7823610 D	00/00/00
				JP	1377370 C	08/05/87
				JP	54001241 A	08/01/79
				JP	61043136 B	26/09/86
				LU	79672 A	13/06/79
				NL	7805379 A	21/11/78
				SE	435909 B,C	29/10/84
				SE	7805718 A	20/11/78
				YU	40520 B	28/02/86
				YU	120478 A	30/04/84
GB	1547761	B	27/06/79	AU	503590 B	13/09/79
				AU	1277376 A	13/10/77
				DE	2615228 A	28/10/76
				FR	2306767 A,B	05/11/76
				ZA	7602086 A	27/04/77
EP	0816515	A1	07/01/98	CA	2209682 A	05/01/98
				DE	29611704 U	17/10/96
				US	5904893 A	18/05/99
WO	8700779	A1	12/02/87	EP	0231311 A	12/08/87
				FR	2585598 A,B	06/02/87
WO	9830345	A1	16/07/98	AU	6207198 A	03/08/98
				EP	0951371 A	27/10/99
				LU	90003 A	09/07/98
				LU	90146 A	30/03/99
				ZA	9800076 A	08/07/98
GB	2007549	A	23/05/79	DE	2844520 A,B,C	26/04/79
				JP	1115560 C	29/09/82
				JP	54059661 A	14/05/79
				JP	57001757 B	12/01/82

INTERNATIONAL SEARCH REPORT
Information on patent family members

02/12/99

International application No.
PCT/FI 00/00054

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1424532 B	11/02/76	AR 197029 A	08/03/74
		AU 467449 B	04/12/75
		AU 5345273 A	19/09/74
		BE 796974 A	16/07/73
		CA 989587 A	25/05/76
		CH 576831 A	30/06/76
		DD 103580 A	05/02/74
		DE 2313320 A	04/10/73
		ES 413355 A	16/01/76
		FR 2176882 A,B	02/11/73
		IN 138261 A	10/01/76
		IT 981492 B	10/10/74
		JP 49005825 A	19/01/74
		LU 67239 A	22/05/73
		NL 7303901 A	24/09/73
		SE 382574 B,C	09/02/76
		US 3853309 A	10/12/74
		ZA 7301865 A	19/12/73
US 4892293 A	09/01/90	CA 1303850 A	23/06/92
		DE 3910136 A,C	30/11/89
		IT 1228771 B	03/07/91
		IT 8919948 D	00/00/00
		JP 1801558 C	12/11/93
		JP 2163307 A	22/06/90
		JP 5007444 B	28/01/93
		KR 9608722 B	29/06/96
GB 2261394 A	19/05/93	DE 4134066 A	22/04/93
		FR 2682312 A	16/04/93
US 4620507 A	04/11/86	AU 548885 B	09/01/86
		AU 8108082 A	09/09/82
		BR 8201170 A	18/01/83
		CA 1171651 A	31/07/84
		EP 0059960 A,B	15/09/82
		SE 0059960 T3	
		JP 1027821 B	31/05/89
		JP 1547621 C	09/03/90
		JP 57146463 A	09/09/82
		LU 83985 A	08/07/82
		MX 157808 A	15/12/88